Oxidation of copper nanotubes embedded in the PET template

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Copper oxide based nanostructures possess excellent physical and chemical properties and has many practical applications such as an medicine, sensors, catalysis, solar cell technology and photovoltaic as well as nanoelectronic. Different approaches have been used to synthesize CuO nanostructures: thermal oxidation of copper, hydrothermal route, aqueous reaction, vapor-liquid-solid synthesis, solution-liquid-solid synthesis as well as physical methods such as laser ablation, arc discharge, precursor thermal decomposition, electron beam lithography, and template-assisted synthesis. However, all these methods require high temperatures, complicated equipment or long reaction time.

In the present study, CuO nanotubes were prepared by a simple wet chemical oxidation of native copper nanotubes with diameter of 400±10 nm embedded in PET ion-track membranes. The structure and the chemical composition of the obtained NTs were studied by the methods of gas permeability, scanning electron microscopy, energy dispersive analysis and X-ray diffraction.

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